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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/081,992

02/21/2002

Been-Yih Jin

10559-587001 / P12768

1734

20985

7590

05/19/2004

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EXAMINER

POMPEY, RON EVERETT

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/081,992

Applicant(s)

JIN ET AL.

Examiner

Ron E Pompey

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 8-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 8-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US 5,545, 574) in further view of Yu (US 6,100,120) and Eguchi (US 5,185,286).

Chen discloses the limitations of:

a semiconductor substrate, the substrate being substantially free of silicon (20, fig. 2);

a gate dielectric layer (24, fig. 2) formed over a portion of the substrate; and

a gate electrode, source and drain regions (26, 32 and 34, fig. 4) further comprising (col. 2, ln. 54 – col. 3, ln. 14): an interlayer dielectric layer (92, fig. 9) over the gate, source and drain (col. 4, lns. 31-35). Chen does not explicitly describe that the well and source and drain are different type of dopants, however, it is inherent and well know that if you have an n-type of transistor that the well and source and drain regions are of different type dopants. Chen does disclose that the device formed is an n-channel device (col. 5, ln. 2).

Chen discloses the limitations of the claimed invention except, wherein the gate dielectric comprises a material having a dielectric constant greater than about 10

wherein the thickness is large enough to prevent a portion of off-state leakage and the interlevel dielectric defines first, second and third openings in the interlayer dielectric layer and further comprising: a metal within the first, second and third openings in contact with gate electrode, source and drain regions.

However, Yu discloses the limitations of forming a gate dielectric with a dielectric constant greater than about 10 (col. 4, lns. 28-31; 22, fig. 4). Yu shows that it is well known in the art to use high dielectric constant materials for gate dielectrics therefore the physical thickness of the gate dielectric has less direct tunnel leakage.

Also, Eguchi discloses the limitations of forming contacts to the device (col. 4, lns. 30-36; 11, 12, 13 and 14, fig. 3). Therefore it would have been obvious to one of ordinary skill in the art to combine Eguchi with Chen, because the contacts allow for electrical communication to the MOS device from external devices.

### ***Response to Arguments***

2. Applicant's arguments filed 3-1-04, pertaining to claims 8-21, have been fully considered but they are not persuasive. The applicant argues that Yu does not disclose or suggest use of a high-k insulator formed on a substrate that is substantially free of silicon. However, Chen discloses that the "Substrate is any of a variety of semiconductor materials" (see column 3, lines 21-22). Therefore one of ordinary skill in the art would use any semiconductor material that is known to the industry, which includes ones that are substantially free of silicon, to form a substrate.

**Conclusion**

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ron E Pompey whose telephone number is (571) 272-1680. The examiner can normally be reached on flex schedule.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (571) 272-1679. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

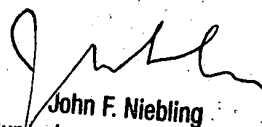
Art Unit: 2812

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

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Business Center (EBC) at 866-217-9197 (toll-free).

  
Ron Pompey  
AU: 2812  
May 17, 2004

  
John F. Niebling  
Supervisory Patent Examiner  
Technology Center 2800